

FLORIDA HIGHWAYS



State Road No. 4; Along Indian River

Vol. II

APRIL, 1925

No. 5

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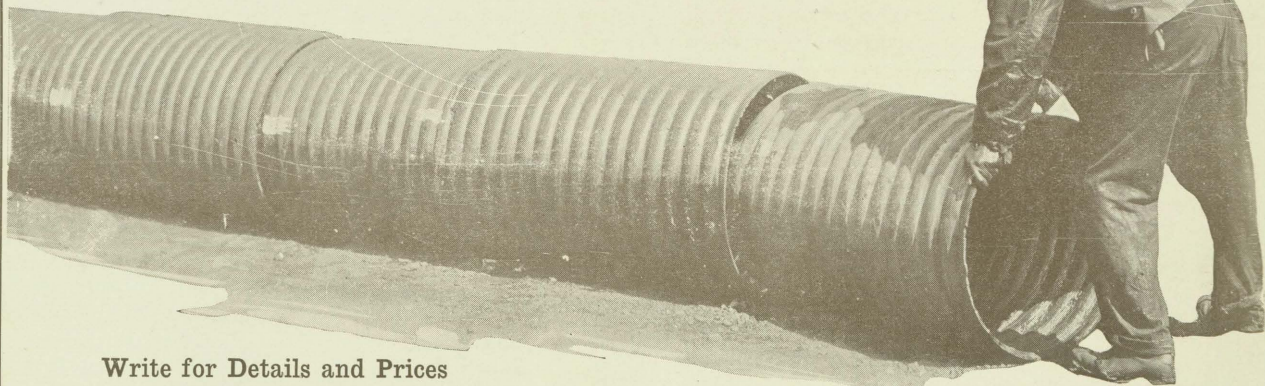
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FLORIDA HIGHWAYS



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Federal Aid Highway System and Its Relation to Florida

By E. W. JAMES, Chief, Division of Design, Bureau of Public Roads

This paper will be a brief account of not only the biggest highway system in the world, but of the biggest program of public works construction ever undertaken by any nation in the history of the world. This undertaking is comprised in the Federal Aid Highway System created by Congress by the Federal Highway Act in November, 1921.

This Act supplemented and amended an original Federal Aid Act of 1916 and greatly improved the original Act by providing that construction should thereafter be confined to a connected and correlated system of proposed highways.

This system of roads was laid out by the State Highway Departments acting in cooperation with the Bureau of Public Roads and the proposed system in each State was then submitted to the Secretary of Agriculture for his approval. The mileage in each State system may not exceed seven per cent of the total public road mileage of the State. All of the interstate connections must be at the State lines and the entire system must constitute a comprehensive and connected whole, which would be complete in itself if all State and county lines were omitted.

To select such a system of roads was in itself a difficult and exacting task and, although it was advanced as rapidly as possible, the system was not

approved in the first State until August, 1922, and in the last State was approved October, 1923.

The mileage of the Federal Aid System in each State was based on a certification by the State in accordance with the law of the amount of public road in the State. This certification stated the mileage of public highways as of record on November 9, 1921. Each State is allowed to designate not to exceed seven per cent of its certified mileage. The original certifications total 2,866,061 miles, and the certification for the State of Florida showed 27,548 miles. This total permits a seven per cent system of 200,624 miles. On January 1, 1925, there had been selected and approved 174,350 miles of this system.

It is the work of constructing this nation-wide system of roads which I have referred to as the biggest program of public works ever undertaken in the history of the world.

Some idea of its magnitude may be secured by a comparison of this system with the national roads of other countries. For many years we have been familiar with the wonderful national road system of France, the total mileage of which is 137,994, but these figures include what we would call class 3 roads which are not a part of the corresponding system in the United States. The first and second class

roads in France comprise a total of 54,059 miles which may be compared with the Federal Aid System of Highways. The Austro-Hungarian Empire before 1914 had 16,096 miles; Bulgaria has 3,688 miles; Portugal 4,248 miles, and Germany, including Prussia, Wurtemberg, Bavaria, and Baden, 28,394 miles. In Spain the entire system of first, second and third class roads amounts to 26,562 miles. The principal national road systems of Europe, therefore, comprise a grand total of approximately 133,000 miles, or about two-thirds of the total system now projected in the United States.

The Federal Highway Act further provides that the system of roads shall be divided into two classes primary or interstate, and secondary and inter-county. The primary roads shall not exceed three-sevenths of the total system and under the present certification of mileage this will provide a system of primary roads amounting to 85,982 miles. The first-class roads of France known as Routes Nationales amount to 23,612 miles, which is considerably less than one-third of the primary road system of the United States.

The classification into primary and secondary mileage has not yet been completed in our system, but is now being selected, and the task of selecting primary routes is almost as difficult as was the original selection of the system and its importance will be clear when we come to discuss the relation of the primary system more particularly to the State of Florida.

Perhaps the largest single engineering undertaking, at least in modern times, was the construction of the Panama Canal. This consisted principally in the removal of enormous quantities of excavated materials. According to the latest report of the Commission the total excavation to date, including the Culebra slides, has amounted to 351,356,750 cubic yards. In 1924 the total material moved on the Federal Aid roads completed in that year amounted to 58,492,000 cubic yards. In other words, the Federal Aid program as it is being normally advanced represents work equivalent to a Panama Canal every six years. It is estimated that at the present rate of construction, the Federal Aid System should be completed in about 12 years, and the material handled exclusive of bridges will be equivalent to approximately two Panama Canals.

When the Federal Aid Highway System of the United States has been completed it will be equivalent to approximately four such system as the French Nation has built for itself.

An examination of a map of the Federal Aid roads as designated and approved discloses some interesting conditions. Considering the network of roads as a whole, a glance indicates that it can be divided roughly into three sections; the eastern or Appalachian area includes the original thirteen States and the States of Tennessee and Kentucky, which were the first to be carved out of our western reserve. In practically all of this area the trails and roads were the process of an entirely natural development; they followed water courses and where necessary connected settlements on these streams by the most direct routes possible in view of the existing topography. The result was a more or less triangular layout of roads controlled very largely by the topography. In the great central Valley of the

Mississippi where hundreds of thousands of acres of public lands existed after the purchase of the Louisiana territory, we find an entirely different sort of network of the road system. Here it is more or less rectangular. This is because the National Government by an organic act affecting the public lands provided for a rectangular subdivision into townships and sections with section line roads. On the Ohio and Indiana prairies in the States bordering the Mississippi and on the western prairies the topography is so regular over enormous areas that there was comparatively little obstruction to the development of roads on these entirely artificial lines at right angles to each other. In this area then we have a more or less artificial system of roads controlled by law and little affected by topography. As soon, however, as we pass beyond the 100th meridian entering first the semi-arid and then the mountainous regions of the West we see a very marked change in the texture of the highway net. It becomes strikingly open and irregular. The system of land subdivision prevailing through the Mississippi Valley is continued in the mountainous States and across the great central plateau, but the topography is so rugged that it controls and road locations accordingly have to be made with respect to the natural surface of the country with little or no regard for the provisions of section line roads.

On the east side of the Sierra Nevada range the system of highways is less dense than anywhere else in the country because of the deserts which cover such enormous areas in this general region. In consequence of this condition there are only six ways to pass through the Rocky Mountain section to the Pacific Coast, although in the Mississippi Valley there may be a multitude of choices possible. A traveler to the Pacific Coast must finally select a route through Yuma, Arizona, through Goffs, California, through Sparks, Nevada, through Ontario, Oregon, through Lewiston, Idaho, or through Spokane, Washington. A line drawn through these points might well be called the Continental Divide.

The difficulties of building any one of these six routes where they cross the western deserts are among the serious problems involved in the completion of the Federal Aid System. The communities are thinly populated, assessed values are comparatively low and available funds are consequently insufficient to provide for the enormous mileage necessary for the construction of hundreds of miles of desert roads that have comparatively little local value. The importance of Federal Aid as a national policy is perhaps no where more clearly or strongly emphasized than in its relation to this condition. In the middle of the last century our nation was able to secure railroad connection between the Mississippi Valley and the Pacific Coast only by making enormous grants of land to what are known as the land grant railroads. These subsidies are now recognized as having been justifiable because of the necessity of connecting with the Pacific Coast and the value of railroad construction in building up the enormous western country. Without Federal Aid, highway connection between the Mississippi Valley and the Pacific Coast would be postponed an undetermined number of years and it is doubtful whether some routes could be completely constructed in the present generation. Just as the nation assisted the rail-



Sheet Asphalt Pavement, State Road No. 2, Orange County. Federal Aid Project No. 13

roads which were private enterprises so the Federal Aid policy assists the States in constructing parts of the Federal Aid System, which are necessary not only for local service, but as parts of interstate and transcontinental routes of the greatest importance to the country at large.

The Federal Aid System as a whole has been very carefully laid out. Perhaps a first impression received from an examination of the map is that the Eastern States have too many roads and the West too few. It is interesting to note in this connection, however, that the center of the Federal Aid System is almost exactly on a line between the static center of gravity of the area of the United States and the present center of population and about midway between them. This indicates that we are planning a little ahead of our population and as the West develops the system can be balanced by additional routes in the western half of the country.

The classification of the Federal Aid System into primary and secondary routes is now being made and in discussing the relation of the system more particularly to the State of Florida, it is interesting to note the routes which will connect the Florida peninsula with the north Atlantic Coast and the interior of the country. From Jacksonville there will be two main routes as far as Savannah and Perry. At Perry one route will divide with a spur to At-

lanta, Chattanooga, Nashville and the north, and another by Gray, Athens and the Piedmont route to Washington. The route via Savannah will branch after crossing the river with one line through Columbia and Raleigh to the north, and another route via Charleston. You will note that an excellent and very direct route would be provided if the road in Georgia from Alma to Augusta by way of Swainsboro and Waynesboro could be made primary. We are now discussing this matter with the State of Georgia, and it is to secure just such conditions as this that the Bureau is lending its constant efforts.

From Lake City there will be a primary road to Perry where connection will be made with previous routes mentioned. Likewise from Tallahassee there will be a direct primary connection northward through Atlanta and by way of Thomasville northward through Savannah to the eastward and through Montgomery to the westward. From Marianna there will be a direct primary connection northward through Dothan and Montgomery. From Pensacola there will be a primary connection through Mobile along the Gulf Coast to New Orleans.

You will understand that these matters are now under discussion and they have not been finally adjusted. It is obvious that these routes as affecting



Florida Highways

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B. A. Meginniss, Attorney for the Department,
Editor and Business Manager

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THE BUDGET MEETING

The annual meeting to consider complaints and suggestions with reference to the year's budget of construction and maintenance work to be done by the Department, was held in Miami, March tenth.

The large number of representatives from every section of the State furnished ample evidence of the popular interest in the proposed work of the Department. It was a matter of more than passing gratification to observe that the tentative budget, as prepared and advertised by the Department, was on the whole satisfactory to those in attendance. Suggestions were made in some instances, but it cannot fairly be said that any actual complaint was lodged. The sentiment seemed to be prompted by anxiety that the proposed budget should be made the permanent budget.

The budget has not yet been finally adopted, but after hearing the various delegations appearing at Miami, it seems improbable that there will be any material changes. Final action will be taken by the Department at its quarterly meeting in April.

THE HIGHWAY ENGINEER'S CREED

I believe that transportation is the keynote of the structure of civilization which is built of school, and church and court, and market place upon the twin foundations of the home and productive industry.

I believe that highway transportation is a necessary and integral part of this connecting stone in civilization's arch and is co-equal with other forms of transportation in sustaining the body of the structure.

I believe that my mission, as a highway engineer, is to assist in shaping and improving the highways of my country, in harmony with those who provide the vehicles which are their necessary complement, to the end that joined with other means of transportation, they may meet the need of our people for easy, quick and untrammelled transportation.—Public Roads.

TIME OUT

Neither Sambo nor Rastus could read the time of day—or anything else—but Sambo had a nice big Ingersoll, which he exhibited with a great air of superiority.

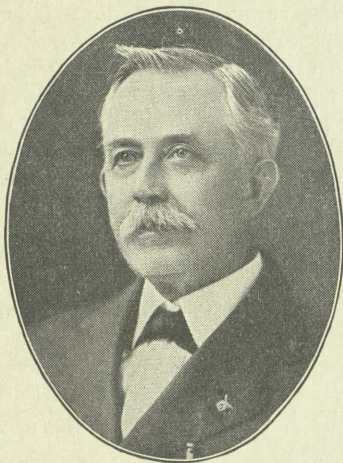
"What time am it?" asked Rastus.

Sambo hesitated, and then extending the time-piece, said: "Dar she am!"

Rastus looked at it carefully, and replied: "Damn if she aint."—Badger Highways.

In the days before the radio,
Before the moving picture show,
Before the auto came along,
Before the law made drinking wrong,
Before the age of problem plays,
Before the crossword puzzle craze,
When all these things we were without,
What did we ever talk about?—Life.

Chairman's Column



INCREASED REVENUES

The matter of a State bond issue to provide funds for the completion of a system of State roads, is being quite generally discussed throughout the State, and it is probable that several bonding propositions will be presented to the Legislature which convenes in April. While this discussion is going on, it will be well to bear in mind that we can have no State bond issue without a constitutional amendment, and such amendment must be voted on by the people at a general election. If the Legislature should adopt the necessary resolution proposing a bond issue, and if such proposal should be approved by a vote of the people, it is probable that two and one-half years would elapse before any funds could be derived from the sale of bonds.

What is to be done during this period? Shall we stick to the construction program outlined by the 1923 Legislature, or shall we change this program and add other roads for immediate construction? Shall we rest contented with the revenues provided under existing laws, or shall we try to augment

these revenues by additional or amendatory legislation?

Let it be understood that we are not arguing for or against a bond issue. As to this matter, we will only say that if we are ever to have a bond issue, the sooner it is had the better it will be. A bond issue now, coupled with a definite road building program, would aid greatly in the development of the State, and would stabilize the status of the Road Department and its work. As the matter now stands, the Department lives and operates from Legislature to Legislature. It can only operate with certainty during a two year period. This state of uncertainty makes it rather difficult to plan for any extended program of work.

In planning for the period that must elapse before any funds can be had from the sale of bonds, it should be borne in mind that the enormous tide of travel and development that has come to our State produces a condition not contemplated when provision was made for the Road Department at the 1923 Legislature. The transportation facilities of the State, both by rail and highway, are wholly inadequate to meet the demands of the ever increasing traffic. For several months past, construction in the State has been seriously hindered and delayed because of the difficulty of getting delivery of material. Road-building is months behind schedule because of this difficulty. The highways in many parts of the State are inadequate to care for the existing travel. The demands upon the Road Department are greater to-day than ever before. This is the present situation. What will it be a year hence? This unfortunate condition could be relieved to some extent if the Department was assured of sufficient means, so that a larger number of contracts could be let and the work speeded up during that period of the year when delivery of materials by the railroads could be had.

If Florida expects to meet the needs of the travel and development that is surely coming, we must have much greater highway and rail facilities.

Contracts Awarded by State Road Department January 1, 1925-March 18, 1925

Contractor	Proj. No.	County	Roads Length Miles	Bridges Length Feet	Contract	Type
Atlantic Bridge Co.....	39-B	Escambia .....	....	1570	\$ 289,113.77	Conc. & Steel
R. H. H. Blackwell.....	45	Madison .....	....	910	124,902.27	Conc. & Steel
Atlantic Bridge Co.....	39-A	Brevard	7.69	....	177,361.80	Rock Base
B. Booth & Co.....	46	Nassau	11.52	....	95,664.77	Grading
Pensacola Shipbuilding Co.	421	Nassau .....	....	560	233,094.18	Steel & Conc.
Luten Bridge Co.....	46	Nassau .....	....	X	52,150.60	Drain. Struct.
Luten Bridge Co.	581	Hillsboro .....	....	X	75,837.26	Drain. Struct.
Barnes & Smith.....	581	Hillsboro	12.10	....	240,237.78	Rock Base
Total			31.31	3040	\$1,288,362.43	

Impressions of English Highway Practice

By A. B. FLETCHER, Consulting Highway Engineer, United States Bureau of Public Roads

This article by Mr. Fletcher, the first of a series to be published in *Public Roads*, dealing with his observations of English highway practice, was prepared as a paper to be read at the Twenty-second Annual meeting of the American Road Builders' Association. In it he presents in a pleasant and interesting way some of the more vivid of his impressions gained in a visit to England in the spring of 1924. In subsequent articles he will deal in greater detail with several of the subjects to which he here refers.

During the spring of 1924 I was detailed to study the rural roads of England. With this not unpleasant assignment I was employed during the months of April, May, and June, and although England did not live up to her reputation for fine spring weather—it rained nearly every day—it was possible to get about without particular difficulty even in the remote country districts. One could forgive the rain for the astonishing beauty of the roadsides which it produced.

In addition to meeting the English road officials, the trip included a journey in a Chandler (American-made) automobile from London to Edinburgh, and a little farther north in Scotland, going up through the counties on the east side of the Little Island and returning to London by way of the westside counties, a drive of more than 1,500 miles.

The main north and south roads were rather generally followed, but the large centers of population and the manufacturing cities were avoided for two reasons. I wanted particularly to see the rural roads; and the heavy traffic congesting the narrow, crooked streets of the cities, built when riding in a saddle was more popular than any other sort of transportation, was not tempting to an amateur driver whose forbears for some generations had been taught to drive on the right-hand side of the street.

They say that even Henry Ford had to yield to British conservatism and put the steering wheel on the right-hand side before the English would buy his cars. The Chandler car, originally made with the steering wheel on the left side, had been remodeled so that the wheel, clutch pedal, and brake were moved to the right side. The gear shift, however, was left in the center and had to be worked with the left hand. One soon learned to make the car go, but the idiosyncrasies of the car, together with passing other cars on the wrong side of the road, made such a thing as intuitive driving out of the question. It was not difficult, however, to go as fast as the law permits, for in England as in Massachusetts the legal limit of speed is 20 miles an hour. The law is obeyed equally well in both places, I should say.

The journey, as it was planned, gave an opportunity to inspect a considerable mileage of the two main north and south trunk lines throughout the length of England.

There are many similarities and some differences between the English country roads and the rural roads of the United States. They are perhaps more crooked even than the roads of our older

States, and the reason for the poor alignment is apparently the same in both countries. In neither country was there any thought of motor traffic or any other sort of fast traffic when the roads were surfaced. Mostly the roads were improved by putting down hard surfaces within the limits of the then existing rights of way. We seem to be making faster progress in this country in correcting that fault, perhaps not because we are more progressive, as we like to think, but because the urge is greater. The motors have come upon us at a faster rate and in greater numbers, relatively, than in England.

Great Britain still has from 20 to 25 per cent of its highway freight moved by horses, while I suppose that in the United States not more than 10 per cent of the traffic is horse-drawn, and in some of the States the horses are no longer counted in the traffic census.

But when it comes to the matter of the riding quality of the roads we have very much to learn from England. I saw no road on my long auto journey so rough as are most of our rural roads, but it should also be said that I saw hardly any so smooth as the best of the roads in the United States built by the State highway departments with the Federal-aid stimulant.

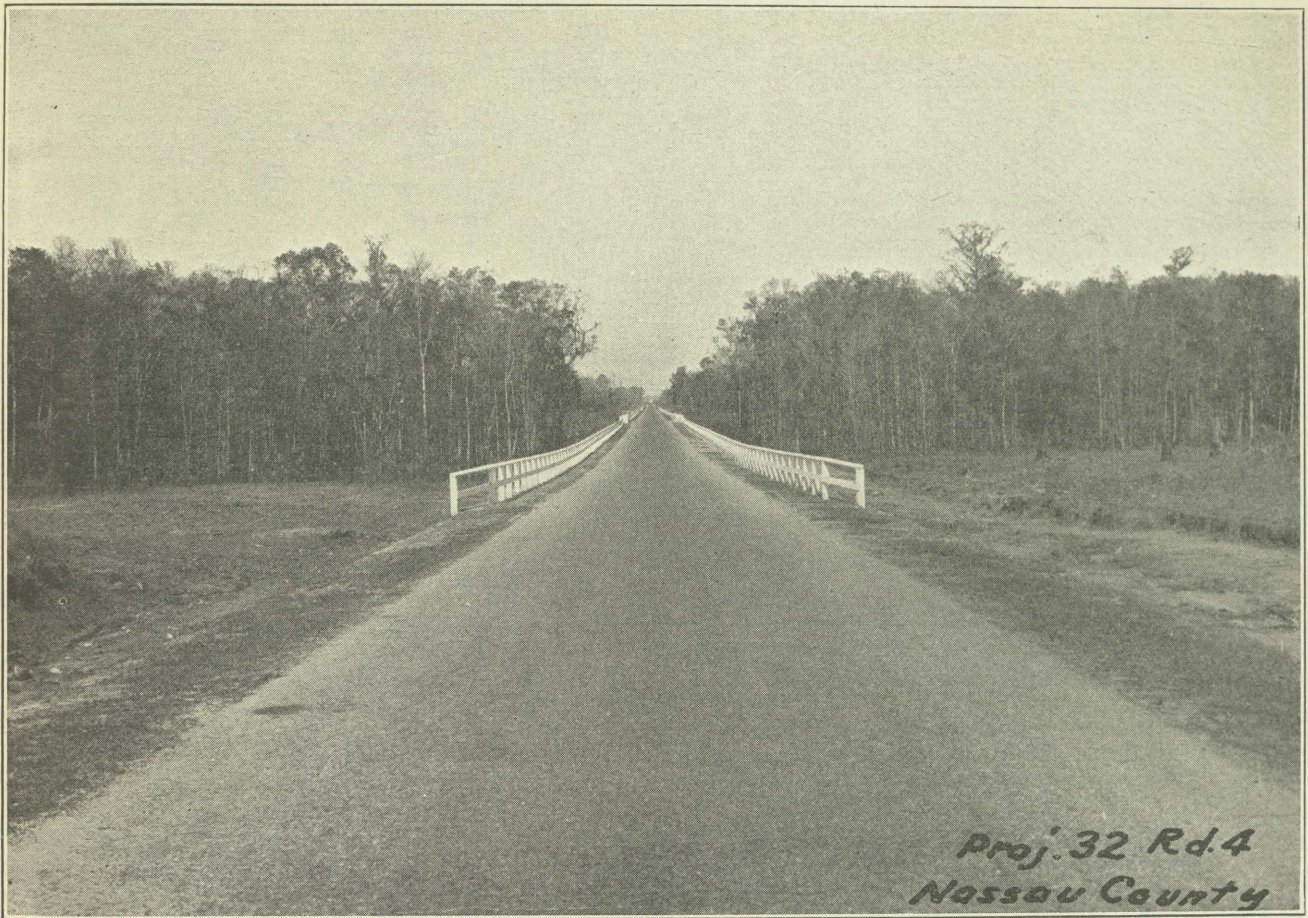
The English and American Road Problems Compared

Our road problem is so much bigger than Great Britain's that the reason for the better average improvement of the English road is apparent. In all England, Wales, and Scotland, there are but 177,000 miles of road, cities and boroughs included, as against our estimated mileage of 2,941,000 outside of the cities and towns. England, Wales, and Scotland have an average of about 242 persons to the mile of road, while in this country there are not more than 35 people to the mile. In Massachusetts, one of our States of dense population, there are about 175 people to the mile.

The English roadside almost invariably is a thing of beauty, and an American has to go to Scotland before he feels at home. For some reason, sparse population and lack of money, perhaps, the Scotch roadsides are nearly or quite as barren and unkempt as most of ours are. The English roads generally have a wide grass border, and there are trees and shrubs everywhere. Sometimes the line of sight is restricted by the roadside growths, but it is plain to understand why even then the shrubs are spared.

The drainage water from the roads disappears quickly from the carriageway and flows off in unseen ditches near the right-of-way lines. The turf at the pavement edge is carefully trimmed and kept so just as in a park. Laborers trimming the edge with spades with a tightly stretched cord for a guide were seen, working as painstakingly as if they were trimming a garden border.

The traffic control at bad road intersections in the country as handled by the agents of the auto-



mobile clubs, in cooperation with the police authorities, is wonderfully well done and worthy of much more attention than can be given to it here. In the matter of road signs, however, I was disappointed. I think that on the whole we mark our roads, at least so far as direction signs are concerned, better than it is done in England.

Nearly all of the roads inspected were of some bituminous type, tar-mac, tar macadam, asphalt, tar-painted, etc. In my 1,500-mile journey not more than a mile or two of the road in the open country was recognizable as being of the cement-concrete type, and some of that had been covered with tar or asphalt. I do not imply that no cement-concrete surfaces have been laid on the rural roads, but seemingly most of the work of that type must be in the cities and towns. The English road officials from Sir Henry Mayberry, chief of the road department of the Ministry of Transport, down to the surveyors of the smaller counties seem to be almost a unit in believing that they can not afford to scrap the great mileage of bituminized roads which they have constructed even if it can be proved that the concrete type is more desirable from the viewpoint of maintenance costs, which they seem to disbelieve. They seem to be thoroughly wedded to the bituminous types of construction.

The reason for their preference is clear when one sees the carefully planned grades, long established, with sodded shoulders, drainage ditches and entering driveways, and when one realizes the great ex-

pense which they have incurred in putting in the heavy road foundations. Notwithstanding the large cost of maintaining the bituminous road surfaces, the Englishman is slow to adopt a road type with which he is not familiar, and he is entirely willing that his American cousin shall make what he calls the experiments. He wants proof of the reputed low cost of maintenance of concrete roads, and in his doubting conservatism he will not admit that the relatively few years of life of the American concrete roads have given them any "history" worth talking much about.

The Cost of Maintaining English Bituminous Roads

How large the upkeep charges are for the bituminous roads is shown in some figures published by the ministry showing the annual cost of upkeep on four class I roads leading out of London into the Provinces.* The total length of the four roads is 321 miles and the report says:

The annual cost of upkeep taken over the whole length of each road ranges from £700 per mile in one case to £980 in another (\$3,360 to \$4,704 per mile).

Assuming the average width of the carriageway of these roads to be 30 feet, and assuming that \$4,000 per mile fairly represents the average annual cost of upkeep, we see that these four roads cost not less than 22½ cents per square yard for maintenance. This annual outlay would appear to be



Federal Aid Project No. 34, Showing Typical Section of Plain Cement Concrete Construction

sufficient to renew completely the wearing surface as often as once in five years. The figures, the report says, do not include any capital outlay for the roads in the past.

I have been unable to find a statement showing the mileage or square yardage of concrete roads in Great Britain. The handbook of the British Portland Cement Association states that 281 concrete roads had been built up to June, 1923. Of these, nearly 79 per cent were built after the year 1920. Many of the roads were very short, some less than one-half mile in length, and evidently the total yardage was not sufficiently impressive to be set forth in the handbook.

On the other hand, much of the new arterial road work in the vicinity of London is of the cement-concrete type, some of it 50 feet in width with the slab 8 inches thick, and the work very well executed, some American equipment being employed.

There are so many types of bituminous road in use or offered for use in England that the patentees have had to tax their ingenuity to find names for them all, but from my observation I believe that the great bulk of the pavements are either some sort of penetration macadam, tar-mac, or merely surface-painted.

I was much interested in looking for wavy conditions or corrugations in the surface of the bituminous roads. The county surveyors will tell one that they have waves in their pavements, and they seem to know what one is talking about when one speaks of corrugations, but their waves are not like

our waves, for I found very little, practically no, evidence of the corrugations which are so prevalent in our bituminous pavements.

Their methods of spreading the bituminous material are much like ours except that they work more slowly than we do, perhaps more carefully and skillfully, but I am forced to the conclusion that the apparent superiority of the British bituminous roads is due very largely to their thick, heavy foundations and in some measure to the use of curbs to confine the pavements at the sides.

Almost without exception the English road is built with what they call "hard core" as a foundation. Hard core may consist of almost any hard material laid as a foundation for the full width of the carriageway. The stones are large, sometimes as large as 8 inches in longest dimension and often as large as the thickness of the layer will permit. The hard core layer is usually from 8 to 12 inches in thickness. Strong hard slag seems to be a popular material, but when that is too costly and brick-bats or stones from walls or buildings are available they are put into the road. The point is, of course, to secure hard unyielding base which will not hold capillary water. The county surveyors are beginning to wonder if these hard core foundations, strong as from our viewpoint they seem to be, are going to be heavy enough for the future motor traffic. When we consider how few of our rural roads have any foundation at all under the 5 or 6 inches of bituminized stones, do we need to look much further for the cause of the corrugations? Or

to explain the apparent superiority of the British roads?

The English seem also to be completely convinced of the need of substantial curbs to prevent the lateral movement of the pavement. All of the new work with which the Ministry of Transport has to do is provided with curbs, and the county surveyors generally are installing curbs in connection with their widening work and extensive repairs.

Bases 12 Inches Thick

Illustrating the extreme care in the matter of road foundations which some of the county surveyors are taking, C. F. Gettings, of Worcester County, told me when I was looking over some of his work with him that because of the bad subsoil with which he has to deal, he first lays a stratum of "blinder," or cinders, 3 inches thick over the subgrade, followed by a layer of slag 6 inches thick, then a layer of 3-inch slag to a thickness of 3 inches, then 3 inches of tar-mac, and finally a dusting on the top of pulverized slag. Thus he has 12 inches of material in place before he lays the wearing course, which he prefers shall be tar-mac. Tar-mac is crushed slag, heated and mixed with a refined tar at the works where the slag is produced and shipped cold to the highway job.

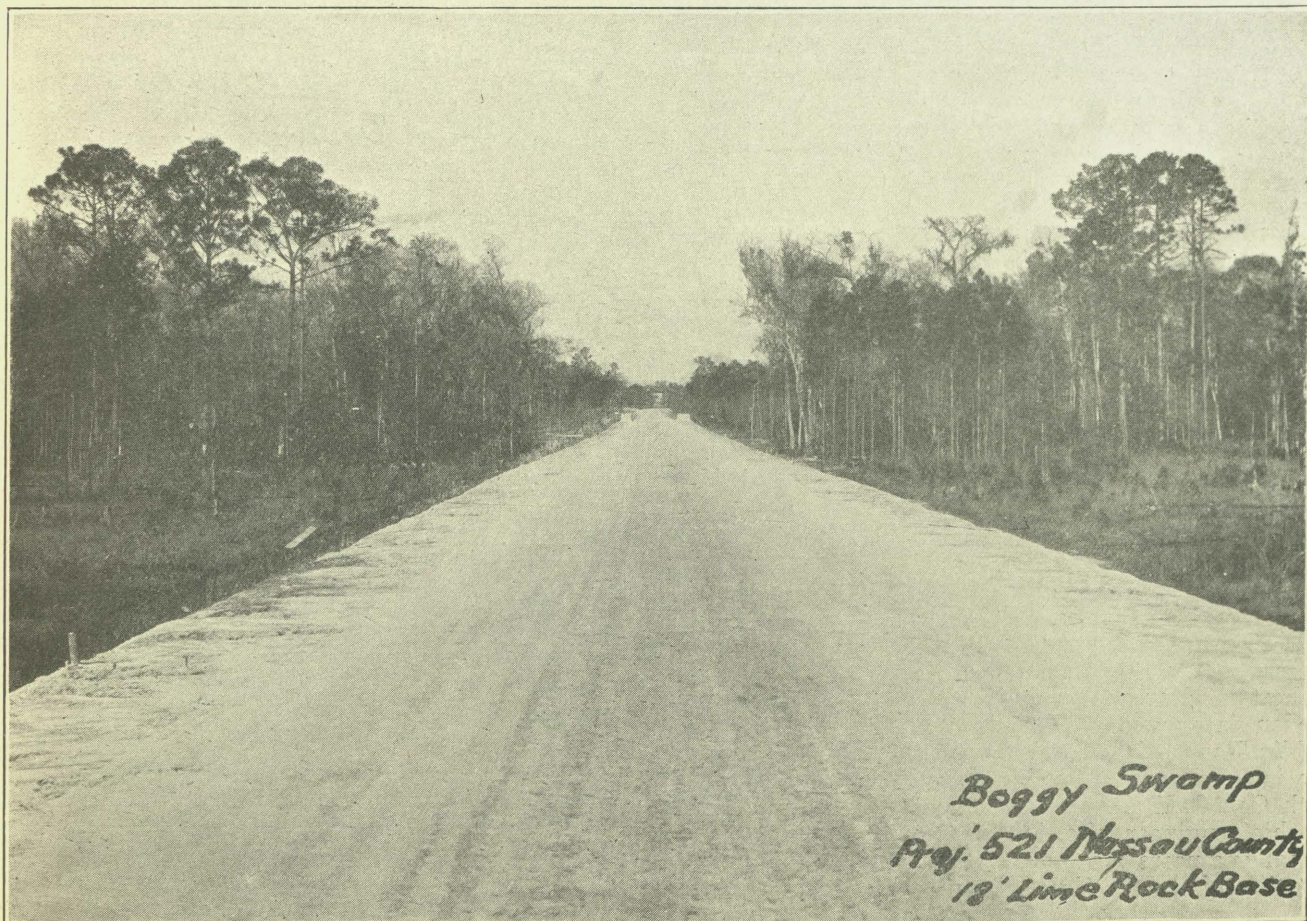
When conditions permit him to do so, Mr. Gettings employs what we in this country have come to call the stage-construction method. First, after rolling as much as is effective the 6-inch layer of slag, he turns on the traffic to further consolidate it. He does the same with the 3-inch slag layer,

sometimes giving it a light tar treatment and allowing the traffic to pass over it for a considerable period, but not after it shows any sign of distress. In this manner he makes sure, before the wearing course is laid, that he has a firm, hard base for it, and that there will probably be no further settlement of his foundation after the pavement is completed.

Some of the best bituminous pavements that I have seen anywhere were built under Mr. Gettings' direction. The traffic over the main Worcester County roads is called heavy. The country is in the Midlands, one of the regions of great manufacturing activity. The traffic census taken by the ministry in August, 1923, indicates that the roads are in the group of 1,000 to 1,500 tons per 16-hour day. We would not consider that to be a very heavy traffic, but Mr. Gettings thinks a carriageway 22 feet wide and of the thickness before stated is needed for the main roads of the country where the subsoil is bad.

The Cost of English Labor

In the United States such substantial work would cost much more than the public is accustomed to pay for the rural highways. The English feel the high cost of their road work, too. Common labor in 1924 was receiving the equivalent of 25 cents per hour, a price which the English employer thought was outrageous, yet we at that time were paying more than double the English hourly wage. Living standards and cost of living are different, but I do not believe the disparity is so great as I had been led to believe.



*Boggy Swamp
Proj. 521 Nassau County
18' Lime Rock Base*

In July, 1924, Portland cement cost in London about \$2.22 per barrel, American basis, and other materials of construction seemed to be not greatly lower in price than in the United States.

The arterial roads near London are of great interest. They are being built in part to supply the general need for more roads, in part to by-pass through traffic so that it will not have to go through the narrow, already congested streets of the metropolis, and in part to provide work for the unemployed.

In England, in 1924, there were more than 1,000,000 persons "on the dole," or supported to a greater or less extent by the Government. Any public work which could be found for these unemployed was welcomed, and for several years the construction of the arterial roads in the Greater London area and the by-pass roads around the cities and towns in the Provinces has provided work for many men. In 1922-23 there was set aside more than \$31,000,000 for the road-fund unemployment program.

In the Greater London area alone, 165 miles of the arterial roads, including the widening and straightening of some roads, are either under construction or planned for, the total estimated cost of the work being in the vicinity of \$60,000,000.

All of this work is being done on a large scale. Rights of way 100 to 120 feet in width are being secured and with much delay and difficulty. When houses are in the way and must be demolished, the public authorities must provide other houses elsewhere to shelter the tenants, so great is the housing shortage.

The carriageways of the most important arterial roads are to be 50 feet wide and curbed. Sidewalks and planting strips are provided for, and iron fences are installed along the right-of-way lines. On the Great West Road all pipes, sewers, water and gas and all electric wires are to be placed in conduits under the sidewalks and planting strips. One section of this road under traffic in 1924 was said to have cost at the rate of £180,000 (\$864,000) per mile.

In the arterial road and by-pass work very low grades are insisted upon, the alignment is as nearly perfect as can be obtained, and no effort seems to be spared in securing the best results in all branches of the work. The pavements, or many of them, are of the cement-concrete-base type laid in most instances with the expectancy of covering them later on with asphalt, but in some cases the concrete is being allowed to take the traffic for the present. The concrete slab, 8 inches thick and reinforced, is said to be costing about 10s. per square yard (\$2.40 approximately).

English Road Administration

The Ministry of Transport took the place of the road board in 1919, and under Parliament it is the highest road authority of Great Britain. Its organization is somewhat like that of the Bureau of Public Roads. The road department of the ministry is in charge of a chief, Sir Henry Mayberry, with Col. C. H. Bressey under him in the capacity of chief engineer who, in turn, has a corps of divisional engineers located at various places throughout the country in direct charge of the operations.

The revenue which the department has for road purposes, derived almost wholly from the registration fees paid on account of the motor vehicles, amounted in 1924 to about £15,000,000 (\$72,000,000). This is about the same sum that Congress has been appropriating recently for our Federal-aid work, but here the likeness ends. Colonel Bressey told me that the annual revenue which the department received represented, fairly closely, one-third of the total sum spent annually by Great Britain for all highway purposes. Such a sum, approximately \$216,000,000, would not go very far toward paying the annual highway bill of the United States, which in 1922 was estimated to amount to more than \$1,000,000,000.

The ministry has divided the roads into two categories, known as class 1 and class 2, and the present policy is to allot to the counties not more than 50 per cent of the cost of improvements on class 1 roads, and not more than 25 per cent to such work on the class 2 roads. Roads less important than class 2 roads are merely local in character, and they receive no money from the ministry.

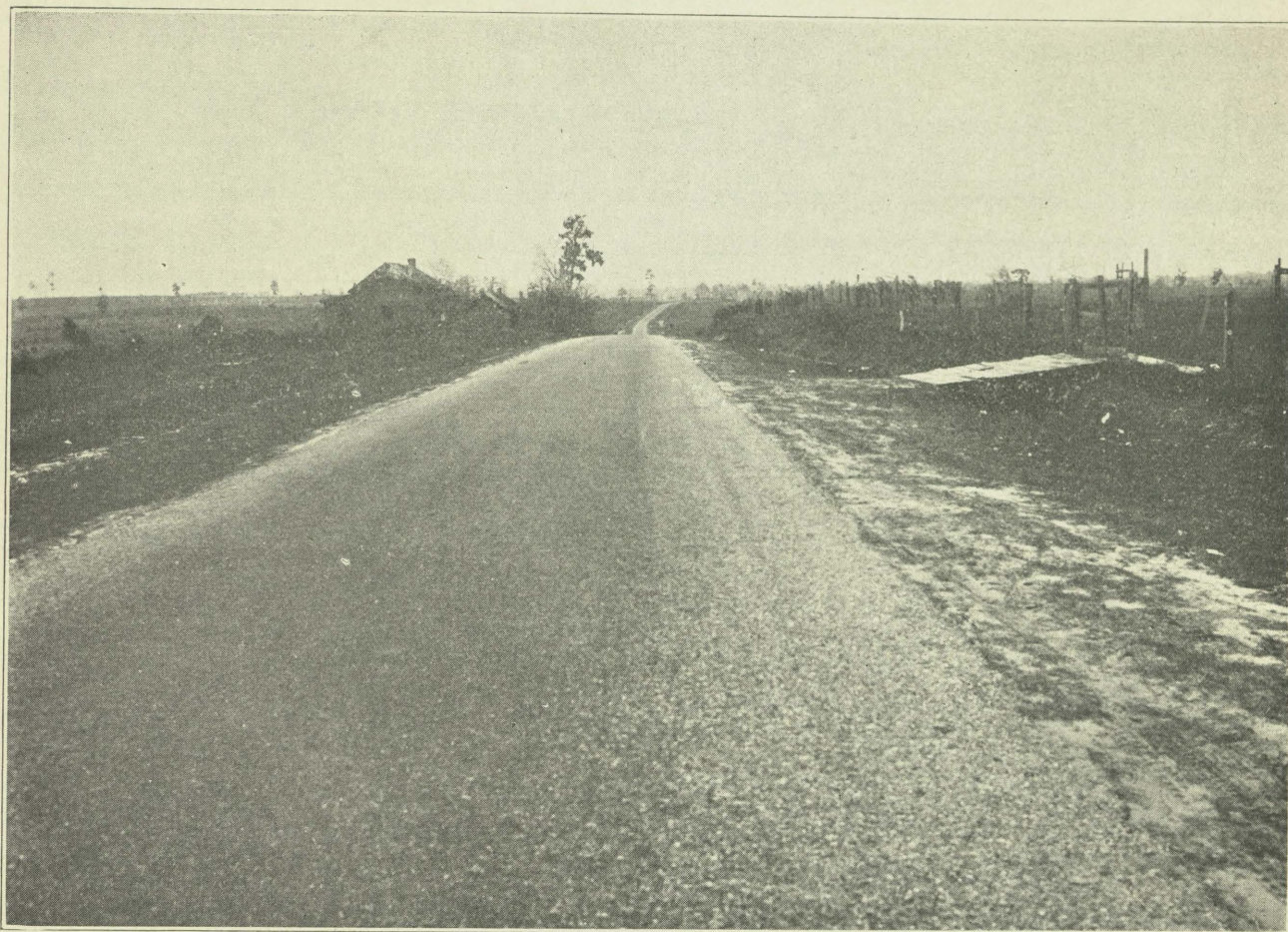
In England, Wales, and Scotland, the total mileage of class 1 roads is about 23,000 miles, and the class 2 roads aggregate about 14,000 miles. The total mileage of all roads, including the merely local ones, is given as 177,321 miles, so, roughly speaking, the ministry is concerned with about 21 per cent of the total mileage of the country.

Gasoline Tax Abandoned in 1921

Prior to January 1, 1921, at which time the present road fund was established, there had been in effect a tax on gasoline or "motor spirit," speaking in the language of the country, by means of which most of the grants made by the ministry were financed. After the year 1915 this tax was at the rate of 6d., about 12 cents per gallon. Beginning with January 1, 1921, the tax was abolished, and in place of the gasoline tax as a revenue producer a tax of £1 (about \$4.80) per horse-power of the motor vehicles was substituted.

This tax is still in effect, and the owner of a Ford car, for example, pays into the public treasury annually very nearly \$100 for the privilege of driving on the British roads. The high registration fee has fostered the manufacture and use of low-powered cars, and special attention has been given to small-cylindered motors and high piston speeds.

The ministry does not favor a proposed plan to return to a gasoline tax, which the motor interests are pressing for, chiefly, I believe, because the officials dislike to abandon a source of assured income for a plan which they think to be less sure. They say they need at least £15,000,000 per annum for the roads; that the present taxing plan will surely produce that revenue; and that their experience with the collection of the gasoline tax prior to 1921 has not left happy memories. The old relatively high gasoline tax was doubtless evaded in many instances. Sir Henry Mayberry says that while the motors were increasing in numbers from year to year in an astonishing fashion the receipts from the tax remained nearly constant. Much of the gasoline and the kerosene imported into Eng-



Bituminous Macadam Surface on Lime Rock Base. Federal Aid Project No. 33, Road No. 2, Alachua County.

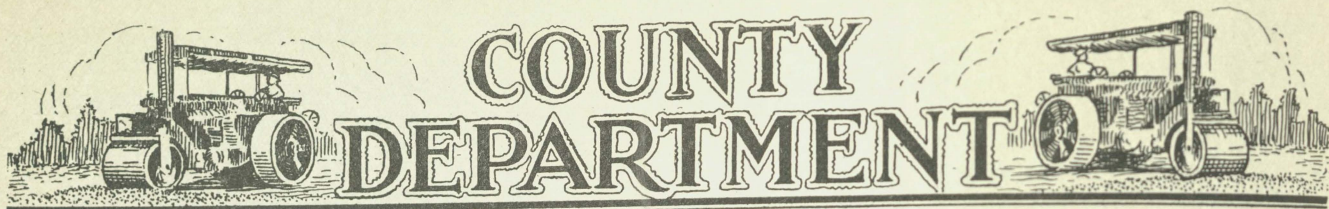
Facts About the Dix River Dam in Kentucky

- 1—The Dix River Power Dam and Transmission System will cost seven million dollars.
- 2—It will be completed within a few months.
- 3—It will assure electric power to Central Kentucky for many generations.
- 4—The dam will be 270 feet high, 700 feet thick at the base, tapering to 24 feet, and 860 feet wide at the top.
- 5—In its construction, 1,600,000 cubic yards of material will be used.
- 6—The idea of a dam on Dix River was forecast by Daniel Boone 150 years ago and carried into execution by a young Kentuckian who made his own and Boone's dream come true.
- 7—The dam will form a lake thirty-four miles long.
- 8—More power will be generated by this dam than is generated by the world-renowned Roosevelt dam in Arizona.
- 9—All the power to be generated has already been contracted for.
- 10—All this is happening with 75 miles of Louisville and twenty miles of Lexington, but few persons are aware of the marvelous feat.
- 11—It will permanently affect the life of Central Kentucky and will be a boon to future generations.
- 12—From an engineering point of view, the Dix River Dam is regarded as one of the wonders of the world.

The site of the dam is in Dix River, three and a half miles from the river's mouth at High Bridge, where the Dix flows into the Kentucky River. Mercer County lies on one side and Garrard on the other. At this historic site, the gorge of the Dix River is very narrow and its limestone walls rise sheer from the water. International engineers of fame have inspected this spot and proclaim it an ideal location for the mighty dam that is now rearing its concrete head above the ceaseless flow of water.

This Herculean undertaking now nearing completion will cost about seven millions in dollars—a sum greater than the public debt of the Commonwealth of Kentucky.—Kentucky Road Builder.

"Don't pay too much income tax," says The Digest. And don't chuckle so while having teeth pulled.—Trinidad Picketwire.



CONTRACTS IN PINELLAS COUNTY EXCEED \$1,000,000

Clearwater.—Contracts have been awarded by Pinellas County Commissioners for the construction of 35 miles of roads and a number of bridges in special road and bridge districts Nos. 6 and 8 at a cost of over \$1,000,000. Road work will consist of approximately 16 miles of asphalt block, 11 miles of bituminous surface treatment and 8.25 miles of bituminous macadam, all 16 feet wide. C. E. Burleson is county engineer, with offices at Clearwater. —Manufacturers Record.

VOTES APRIL 7 ON \$1,330,000 OF BONDS

Dade City.—Special election on a proposed bond issue of \$1,330,000 in Pasco County has been called for April 7 by the County Commissioners. The commissioners have been engaged for several weeks working out a tentative program of road construction and have secured F. D. Cosner, a road engineer of this city, to prepare preliminary estimates of the cost of the several projects under consideration. —Manufacturers Record.

The Key That Unlocks Paradise Is Climate

The citizens of Halifax country, Florida, recently gave a large banquet at the Clarendon Hotel, Seabreeze, to a group of life insurance field men.

One of the speakers was Darwin P. Kingsley, former president of the Chamber of Commerce of the State of New York, and now president of the New York Life Insurance Company, whose officers and field men were the guests of the evening.

Among other things, Mr. Kingsley said:

"We are rapidly coming to understand that climate is a great asset. People formerly were disposed to swear at Florida and the South generally because, particularly in Florida, the chief asset, they thought, was climate.

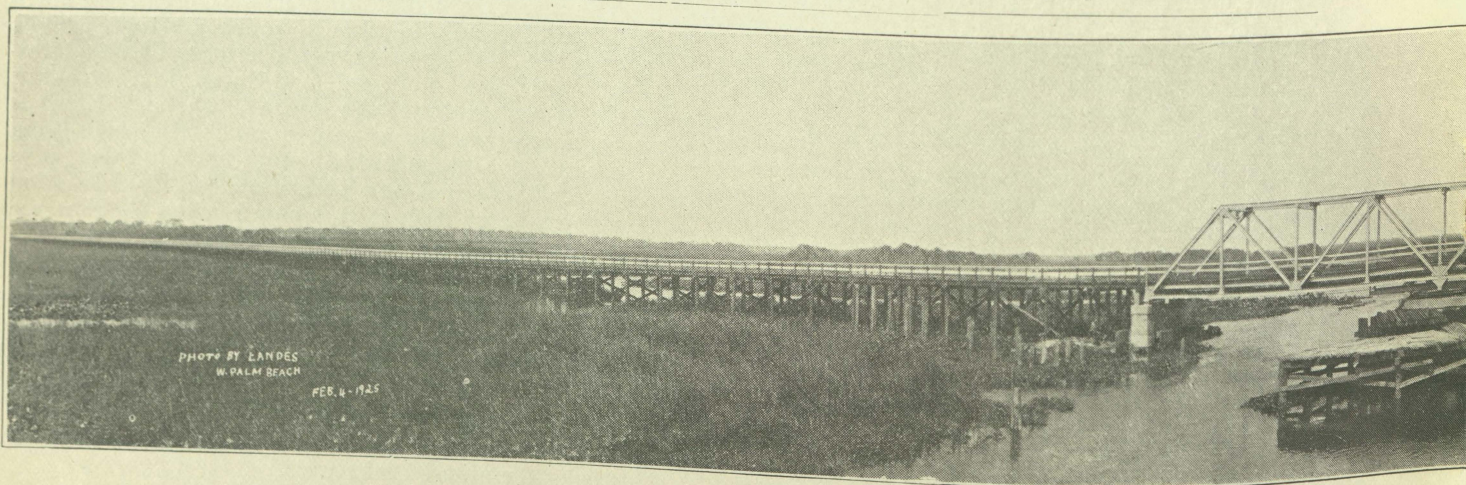
"The swelling prosperity of the South is compelling all of us to realize the resources of the South and to place at or near the top of the list of its assets climate. On reflection we see that this was always inevitable. Some one has said that we can live for a month without food, for a shorter time without water, but shut off all air for five minutes and at the end of that time we would be dead.

"The quality of the air we breathe is necessarily of first importance. Is it harsh or balmy, frigid or mild? Does it bring bronchitis and pneumonia on its wings, or does it bring healing? Must we house ourselves for half the year in stuffy, steam-heated rooms, or may we live in the open and sleep in the open?

"All these questions answer themselves and explain, in large part, the migration to Florida and southern California. If Ponce de Leon had come to Florida with no idea in his head of the Fountain of Eternal Youth, the idea that such a fountain existed somewhere here would naturally have occurred to him. Now thousands are yearly coming to Florida and the South, seeking for and finding what Ponce de Leon sought and never found.

"Fleeing from the winters of the North, people find here climate and much more. They find undreamed-of natural wealth, and they remain to help make the South great.

"Florida has had three great pioneers, not includ-



Bridge over Kissimmee R

ing the great Spanish adventurers of centuries ago. These pioneers are Flagler, Plant and Warfield.

"What vision, what courage Flagler had! Has anyone, since the little band that landed in New Plymouth in 1620, quite equaled him? On the West Coast, Plant also discovered a new empire. And now Warfield, of Baltimore, with equal courage, is opening up the marvelous richness and beauty of central Florida; Warfield, the most modest of men, whose genius and courage more than any other single man or thing gave the country the Transportation Act of 1920.

"I speak of these men as pioneers. But when a man from New York plays golf in his shirt sleeves in January, and after dinner walks on the piazza of his hotel without an overcoat, he discovers that there are pioneers and pioneers. May we indeed go pioneering in Paradise!

"What Flagler and Plant did, that Warfield is doing. How few of us knew that! How slow we were in discovering the truth! But we are coming now by thousands—and the key that unlocks this paradise is climate."

In this Mr. Kingsley has stated clearly and forcibly the value of climate as an asset of inestimable worth. As one reads day after day the reports of the terrific weather, the snows and blizzards and the sleet of the West and of the North, and contrasts it with the climate of the South, where such things are almost unknown except in the mountain regions, he cannot but be impressed with the tremendous economic value of climate.

For the greater part of the winter the North and the West have been enduring intense cold and heavy snows, which add to the cost of doing business, to the cost of railroad operation, to the cost of farming and to the cost of living. This intense cold, which prevails every winter in a large part of the country outside of the South and the Pacific Coast, is a liability under which everybody labors who lives in those sections.

Such climatic conditions, moreover, drain the vitality of millions of people and bring about many diseases and deaths. On the other hand, the people of the South, or a very large part of the South, can live an outdoor life nearly all of the winter. There are few days in the South when outdoor life is not only possible but pleasant, in striking contrast with the conditions elsewhere. Rivers in the South do

not freeze, hydro-electric operations are not delayed by ice-congestion, mills do not have to close because of freezing weather, farmers do not have to stop all outdoor work as in the regions where blizzards everlastingly prevail.

A recent visitor in Florida, coming from Illinois, said he lived in a country where bitter weather prevailed for nearly nine months of the year, with burning heat throughout the other three. Neither of these conditions are found in the same way or to the same degree in any part of the South.

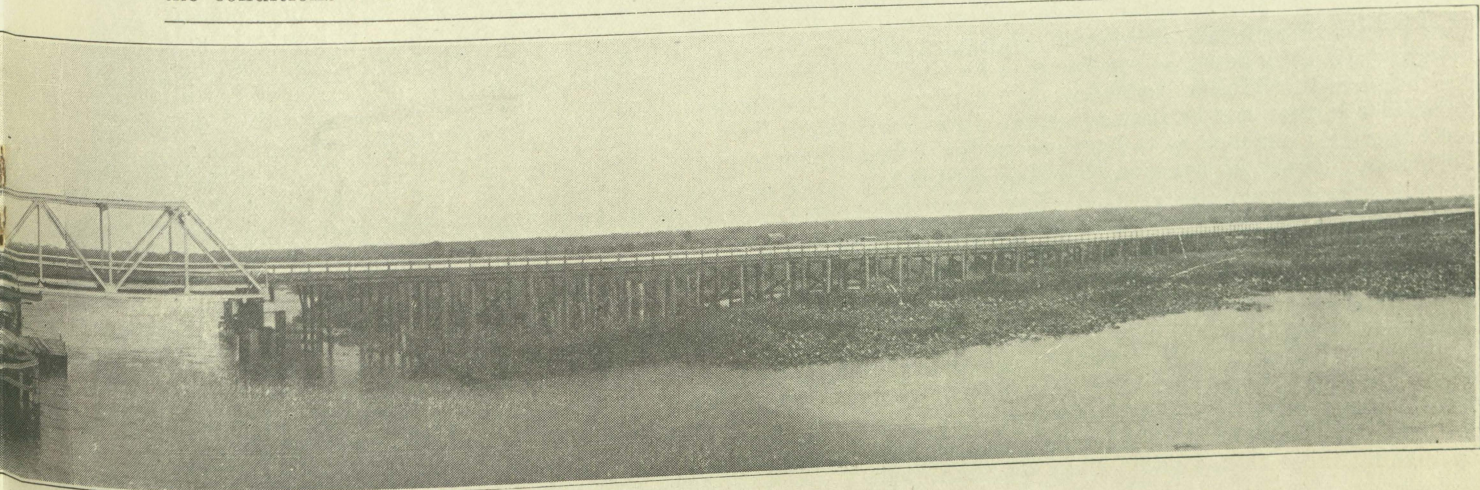
We are glad that Mr. Kingsley has set forth the value of climate. Climate is largely responsible for the wonderful progress of California. It is likewise responsible, to a large extent, for the amazing activity in Florida, where the tourist business is so great that 45 Pullman trains during this winter are daily entering the State to carry the rush of people from less favored regions to seek the climate of Florida.

Florida, however, is not alone in this blessed privilege of a good climate. All along the South Atlantic and Gulf coasts, from Hampton Roads to the Rio Grande, climatic conditions during the winter are attractive, and from the coast region up through the Sand Hill and Piedmont regions to the high mountains there are climatic advantages which are becoming more and more appreciated by hundreds of thousands of people who flee from the cold of the North and the West, seeking the delightful climate of these sections.

Mr. Kingsley has rendered a distinct service to the country by his striking presentation of the value of climate as an asset—Manufacturers Record.

OLD AMERICAN ROADWAY

The old Spanish road, built across Mexico in the Sixteenth century, is believed to be the oldest road on the North American continent. It was built in the form of a letter "Y," with the lower point of the stem starting at Vera Cruz on the Gulf. The northern prong touches the Pacific at San Blas and the southern tip at Acapulco. Because of this road the west-bound convoys from the Philippines were spared the dangerous navigation around Cape Horn. There is still evidence that this trail was used by the Indians before the Spaniards broadened it from a pack-mule path to a highway.—Rio Grande Farmer.



River on State Road No. 8

More Federal Aid Money for American Roads

Government Authorizes \$75,000,000 for Each of Next Two Fiscal Years

Authorizations for Federal Aid to highways amounting to \$75,000,000 for each of the fiscal years 1926 and 1927, and \$7,500,000 for forest roads for each of these years were finally passed by the United States Senate on February 6.

The vote on the so-called Dowell Bill, which previously had passed the House of Representatives, was sixty-five to five with twenty-six Senators not voting. The negative votes were cast by Senators Bingham of Connecticut, Pepper and Reed of Pennsylvania, Wadsworth of New York, and Walsh of Massachusetts.

An effort was made by Senator Reed of Pennsylvania to reduce the allotment of Federal Aid for

1926 to \$60,000,000, but this failed by a vote of thirteen to sixty-one.

The new bill amends the Federal Aid Highway Act by providing that non-taxable Indian lands shall be classified as public lands. The effect of this amendment will be to permit the Federal Government to pay a somewhat larger percentage of the cost per mile than fifty per cent in those States which contain large areas of such lands, although it does not increase the allotment of Federal Aid to the State.

This measure, including the Indian lands amendment, was strongly supported by the American Automobile Association and its member clubs throughout the country.

Since 1916 there has been appropriated or authorized a total of \$752,000,000 for Federal Aid, of which \$690,000,000 was for the improvement of the Federal Aid Highway System and \$62,000,000 for the building of forest roads and trails.

The Federal Aid Highway System, which is limited to seven per cent of the main trunk and interstate highways of each State, now embraces approximately 175,000 miles. Not to exceed one-half of the cost of this great system is being paid for by the Federal Government.

Up to January 31, 1925, there was completed with Federal Aid 37,997 miles, while 17,609 miles were still under construction and 1,765 miles were approved for construction. On January 31st of this year there was a balance in the Federal Treasury available for new Federal Aid projects amounting to \$52,608,938.

At the present rate of progress, it is estimated that this, the greatest system of highways ever constructed by any nation, will be completed within the next ten years.—American Motorist.

Federal Aid Appropriations and Authorizations

Fiscal Year Ending June 30th	For Federal Aid Highways	For Forest Roads and Trail
1917	\$ 5,000,000	\$ 1,000,000
1918	10,000,000	1,000,000
1919	65,000,000	4,000,000
1920	95,000,000	4,000,000
1921	100,000,000	4,000,000
1922	75,000,000	6,000,000
1923	50,000,000	11,000,000
1924	65,000,000	7,500,000
1925	75,000,000	7,500,000
1926	75,000,000	8,500,000
1927	75,000,000	7,500,000
Totals	\$690,000,000	\$62,000,000
	Grand Total \$752,000,000	

FLORIDA BUILDS ROADS

Will Rogers ought to know. He knows almost everything worth while, which is one reason why he draws packed houses in New York theatres whenever he appears. His comprehensive education includes even a knowledge of Florida highways and he might even have heard about Lakeland spending more than a million dollars to find parking space for automobiles so they can be parked on the downtown streets in such a manner as to leave room for a few other cars to pass. As regards Florida's system of highways, the general belief that they were constructed to serve the public and to open up the hidden riches of the State to development is, according to Will Rogers, all wrong. Here is his version of why Florida is building such an enormous mileage of paved highways:

"Nineteen hundred and fourteen saw several changes in this great vehicular movement. The Ford Company passed its first 1,000 a day production. People thought then, My Lord, will they ever stop turning those things out! They are like Japs,

they were multiplying something terrible. So America woke up and said, we've got to have somewhere to put these things, and somebody thought of the idea of building roads to store them on, so when they commenced to make roads, why, Uncle Henry would clutter them up with these Things. It got so it was the entire nation organized against one man. Every State said to themselves: "We will build some vacant roads," but the minute they got 'em built, why, they found there were thousands of people there waiting to twist a mechanical thing's tail and away it would go and fill up their road, just as much as it had been with rocks and trees before they had built it. He has filled every road that was built. I don't care where you try to hide a road, why, one of Mr. Ford's road fillers will find it."—Lakeland Star-Telegram.

Here's to the memory of Joseph Kohn,
He wouldn't put his skid chains on—
And one wet day, like a drowned rat,
He crossed the Styx in nothing flat!

—Macon Telegraph.

A. A. A. Urges Immediate Adoption of National Uniform Highway-marking Code

Multiplicity of Design, Color and Symbol in Highway-Marking Today is Found to be a Contributing Cause to Accidents

Millions of motorists using the travelled highways of the country are in constant danger of running headlong into lurking accident traps because of the lack of a uniform road-marking system for the country as a whole, declares a warning broadcast from the National Headquarters of the American Automobile Association.

According to the A.A.A., which is now engaged in working out the features of a practical safety program in conjunction with the Hoover Conference on Street and Highway Safety, too many automobile accidents are directly traceable to the lack of uniformity in the danger and road signals on the national highways.

The A.A.A. statement was issued coincident with a strong appeal sent to its 700 member clubs urging them all to get behind the national organization in a campaign looking to the development as quickly as possible of a nation-wide program to standardize and bring uniformity into the hazard signals on the highways.

A comprehensive study of the road-marking systems of the forty-eight States of the Union was recently concluded by the A.A.A. The findings of the investigations were embodied in an illustrated pamphlet designed for use by the various forces now working to secure uniformity, such as the Hoover Conference, the Engineering Standards Committee, the Joint Committee composed of highway officials and representatives of the Bureau of Public Roads, automobile clubs and chambers of commerce.

Urging the imperative need for immediate action, Thos. P. Henry, President of the American Automobile Association, described the situation relative to highways signs today as "highly alarming and a standing menace to every user of the roads."

"The investigation," said Mr. Henry, "has thrown fresh light on one of the contributing causes of automobile accidents. Instead of having one national highway-marking system, we have now practically as many systems as there are States, while not infrequently the wayfarer runs into marked differences of practice within the same State. Even with regard to the most serious accidents hazards such as railroad crossings, through roads and curves, there is practically no uniformity.

The motorist runs into every kind of design, color and symbol and he must learn a new set of hazard signs whenever he goes into new territory. This lack of uniformity which is the bane of the highways today applies to all types of signs, the cautionary signs at danger points, the traffic control signs and the distance and direction signs as well.

"The situation confronting the automobilist on the highways today resembles that which would exist if the railroads of the United States had a different type of block signal, warning sign and cross-

ing signal for every State in the Union, except that as compared with the motorist the railroads would still have an advantage in that trains are run on protected rights of way, in charge of trained crews and under an orderly train dispatching system. On the other hand, whereas the railroads carried 35,000,000,000 passengers over a distance of one mile in 1924, it is conservatively estimated that automobiles carried 160,000,000,000 passengers.

"Proper road marking is essential to maximum service, while poor road marking and the variety of signs for the same purpose constitute a standing menace to every motorist. The inevitable reaction of the motorist to the confusing variety of signs is that while motoring he misses the warning for a bad curve or a sunken road entirely and is further confused by the prevalence of commercial signs many of which specifically imitate warning signs. Up to the present the business of marking the highways has been entrusted to a variety of bodies, state highway commissions, automobile clubs and even advertisers. There was all the room in the world for experimentation. There was no uniform legal obligation on one single body. Many states have not yet adopted a standard marking system of any kind and an extraordinary amount of diversity has crept into the posting system of the States whose roads are on the whole well mapped.

"Before there is uniformity there must be a national code subject to ratification and adoption by all the States. This is something behind which all motorists can get and the A. A. A. is putting it forward as a practical and urgent step in a safety program.

"The fact should not be overlooked that aside from the hazard, the stranger often travels many miles out of his way because of poor marking. Hundreds of vehicles a day go much greater distances than are necessary and the loss may average as high as ten cents per vehicle mile to the owner of the machine and two cents per mile for maintenance of the road.

"The advantages that would accrue from a uniform marking system for the country are self-evident. Drivers from different States would recognize signs as having identical meanings. There would be only one sign for a railroad crossing and not a dozen signs as there are today. A certain color and a certain design would convey an immediate message of successive degrees of danger. The use of the same sign for the same purpose would become general. The cost of maintenance would be reduced, the method of installing would become more uniform and this in turn would cheapen installation and expedite transportation. Above all, it would save lives.

"If we had a national code it would be possible



Surface-Treated Lime Rock Base, built by State Forces in Volusia County, Road No. 3

Federal Highway Construction

The Federal Highway Act, signed by the President on November 9, 1921, is one of the high-water marks of highway legislation in the United States. It is the logical outcome of the tendency toward scientific management and orderly procedure in the development of the roads of the country which began with the creation of the first State highway department in New Jersey in 1891 and which was given renewed impetus by the Federal Aid Road Act of 1916. The effect of the earlier Federal legislation was to establish in every State an adequate highway department competent to deal with the difficult problems attending the upbuilding of the main roads of the country to make them fit for the use of the rapidly increasing number of motor vehicles.

The important provision of the Federal Highway Act is the establishment of a connected system of main interstate and intercounty highways, the improvement of which is to be accomplished with Federal Aid. The Law limits the extent of the system to 7 per cent of the existing mileage of record in the various State highway departments at the time the law became effective, and provides that the roads to be included in it shall be designated by the several State highway departments subject to the approval of the Secretary of Agriculture.

Within two years of the signing of the Act the important work of selecting the roads had been completed and a map of the approved system, including 168,881 miles, was published on November 1, 1923. Since that time there have been additions in several States which bring the total approved mileage up to 171,687 miles.

It is estimated that the construction of the roads of the system will require approximately 10 years. In that time every city or town of at least 5,000 population will be connected by a net work of modern roadways built in accordance with scientific principles, and every link designed to carry with safety and economy the traffic to which it will be subjected.

All highways upon which Federal Aid funds have been expended since the approval of the Act are parts of the system, and practically all Federal Aid roads previously improved are also included. At the close of the fiscal year the completed Federal Aid roads amounted to 35,157 miles, with 15,350 miles additional under construction reported as averaging 56 per cent complete. With the exception of a very limited mileage, improved before the passage of the Federal Highway Act, all of these roads are included in the system. In addition it is probable

that more than an equal mileage has already been improved by the States and counties without Federal Aid.

Already three States have completed the system originally designated and additions have been approved as provided by the law. In the country as a whole it is probable that the mileage improved is fully half the total mileage of the system.

No less important than the construction of roads under the Federal Highway Act are the fundamental scientific researches which have been conducted by the department during the past four years. It is impossible to overrate the importance of this work, the results of which constitute a large proportion of the considerable body of scientific knowledge that has been acquired in recent years. The researches of the Bureau of Public Roads cover the entire field of highway management, construction, maintenance and finance.—Report of the Secretary of Agriculture for 1924.

SPEAKING OF GOOD ROADS

E. V. COLE

William Snort and his neighbor Bunk
Met one day where a right smart chunk
Of the old dirt road had washed away
From an overflow of the creek that day.
Said Snort as he stroked a reflective chin
And closed the throttle o' the thing o' tin.
"Blast my hide if it don't look like
We'll have to vote to build a pike.
I've always said I'd never stand
For any more taxes agin my land,
But the roads are gettin' in such a mess.
I'll swan to you I must confess
I'd about as soon pay for a new highway
As to always be stickin' in the mud this way."
Then he opened her up and threw in the clutch;
He gave her gas, but she didn't move much
Till Bunk got out an' sloshed around
And looked about till he had found
A pole and a rock, and heaved away,
And got all covered with mud and spray
From the old tin boat as the wheels spun round,
While Snort was a pullin' to firmer ground.
Well, a day came on in the month of May
When the voters were asked to come up and say
If the roads they had were good enough,
Or whether they'd agree to pay for the stuff
It'd take to build a new highway
That'd last almost till the Judgment Day.
The voters voted to build the road;
So did Snort and Bunk who'd bro't a load
Of hay to town on a two-ton truck;
And were mad because three times they'd stuck
Where the old dirt road had washed away
From an overflow of the creek that day.
The road was built and Snort now rides
In a new twin-six, while Bunk he glides
In a limousine. It seems like Providence
Has smiled on those two men ever since
They went to town on that fateful day
And voted to build a new highway.
—Farm and Ranch.

Motors
Run Smoother on

CROWN
GASOLINE

—AND—

POLARINE
OIL

STANDARD OIL COMPANY
INCORPORATED IN KENTUCKY

AMERICAN TAR PRODUCTS COMPANY

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COLORS OF STATE LICENSE TAGS

The following is a list of the license tags of the various States, showing the colors of each State for the year 1925:

State—	Background	Lettering and Numerals
Alabama.....	Red	White
Arizona.....	Copper	Black
Arkansas.....	Black	Silver
California.....	Yellow	Black
Colorado.....	Maroon	White
Connecticut.....	Dark Blue	White
Delaware.....	Orange	Black
District of Columbia.....	Dark Blue	White
Florida.....	Dark Green	Orange
Georgia.....	Blue	White
Idaho.....	White	Black
Illinois.....	Brown	White
Indiana.....	Ivory	Maroon
Iowa.....	Gray	Black
Kansas.....	Red	White
Kentucky.....	Green	White
Louisiana—		
22 H. P. or less.....	Maroon	White
23 H. P. or more.....	Gray	Red
Maine.....	White	Blue
Maryland.....	Green	White
Massachusetts.....	Black	White
Michigan.....	Taupe Gray	Black
Minnesota.....	Aluminum	Black
Mississippi.....	Orange	Black
Missouri.....	Not available	
Montana.....	Red	White
Nebraska.....	Orange	Black
Nevada.....	Blue	White
New Hampshire.....	White	Green
New Jersey.....	Blue	Aluminum
New Mexico.....	Not available	
New York.....	Yellow	Black
North Carolina.....	Chinese Blue	White
North Dakota.....	Purple	White
Ohio.....	Cream	Black
Oklahoma.....	Black	Aluminum
Oregon.....	Lemon	Black
Pennsylvania.....	Blue	Gold
Rhode Island.....	White	Black
South Carolina.....	Shamrock Green	Black
South Dakota.....	Siennese Drab	Black
Tennessee.....	Maroon	White
Texas.....	Maroon	White
Utah and Nevada.....	Green	White
Vermont.....	Green	Gold
Virginia.....	White	Black
Washington.....	White	Blue
West Virginia.....	Old Gold	Dark Blue
Wisconsin.....	Medium Blue	Yellow
Wyoming.....	White	Black

Last year approximately 50,000,000 cement sacks were lost or destroyed in this country. Over 50,000 bales of cotton were required to weave the cloth for sacks to replace the losses. This would make a strip of cloth over 28,000 miles long.

Paving Wisdom

By FRED E. RIGHTOR

Following immediately in the wake of good roads and paved streets has come the invention of nearly all our labor—and time-saving machines and implements, whether on the farm, ranch, in the factory or home. Good roads and improved streets have been the greatest stimulant to industry.

Antedating even Julius Caesar, some of the world's greatest patriots have concerned themselves with the building of good roads and permanent highways, both rural and urban. They have been our chief civilizing influence.

The country or state having the best highways and streets will be found to excel in wealth, civic pride, patriotism, education and general welfare. Prejudice, intolerance, ignorance and moss-backism cannot thrive in a country dedicated to building beautiful roads and streets. The most illiterate sections of America prove this statement to be true.

Any tax-paying citizen or voter should consider it a patriotic duty and a contribution to his fellowman to vote for bond issues designed to promote and foster better roads and more beautiful streets. Such expenditures were never known to work hardships on any people or class of citizen.

As an example of the philosophy of "The greatest good to the greatest number," no better can be found than the principle of extending our highways and improving our streets.

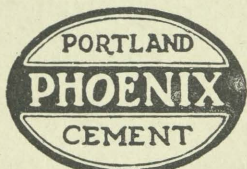
Good roads to the country are what good streets are to the city.

No other economic factor can add as much to land values—a fact land owners and farmers have been too slow to realize. Good roads have built most of our schoolhouses, established social levels and brought about a community of interests unknown before the day of road improvement and modern vehicular transportation.—The Rotarian.

The big tunnel to be built under the Mersey, at Liverpool, is of special interest to us at the present time in view of the progress being made in driving the twin vehicular tunnels beneath the Hudson River, at New York City. Although the English undertaking calls for a single tunnel, the capacity of that tube will be greater than that of the American tunnel as it is to carry four rows of vehicles in an upper division and two lines of tramways in a lower one. Continuous traffic in both directions will complicate the ventilating problem, the solution of which will be the most interesting phase of the entire project.—Ex.

While working on the new Truckee River highway near Reno, Nev., a steam shovel encountered a solid body of ice, measuring 60x20x10 feet, covered with 12 feet of earth. The workmen were finally compelled to use high explosives to break a way through the obstruction. The ice, supposed to be at least 40 years old, is assumed to have been a field of snow that was buried and compressed by an enormous landslide on the mountain above.—Ex.

THE MANY MILES OF CONCRETE
HIGHWAYS IN FLORIDA PROVE
THE SUPERIORITY OF THIS TYPE
OF PAVING



STANDARD SINCE 1898

Phoenix Portland Cement Company

PLANT NO. 1	PLANT NO. 2	PLANT NO. 3
1,000,000 bbls. annually	1,500,000 bbls. annually	(To be con- structed)

**Protect yourself
against delays**

Delays tie up men and machines—retard progress—eat up profits! Protect yourself. You can. On that next job write

Arrowhead aggregates into your specifications. Products of an electrically operated plant: capacity, 4000 tons a day. Washed, screened, sized to meet exacting Federal Aid Specifications—and your own.

**4000
TONS
A
DAY**

MONTGOMERY GRAVEL CO.

Office: Shepherd Bldg.
Montgomery, Ala.
Plant: Arrowhead, Ala.

BRANCH OFFICES
Birmingham, Atlanta,
Thomasville, Orlando

Federal Aid for Roads Brings Results

Nine thousand miles of Federal aid highways were completed in the last fiscal year, bringing the total mileage to 35,157, says an announcement of the Bureau of Public Roads, Department of Agriculture. Last year's work constitutes a new record. This year's program will surpass that of 1924.

Texas leads in miles of completed Federal aid roads with 3,161 miles, while Minnesota is second with 2,310. Texas also is first in mileage under construction with 1,457 miles, Missouri is second with 878 miles, and Alabama is third with 850 miles.

Texas and New York receive the largest allotments of Federal aid, which is distributed on the basis of population, area and mileage of State highways.

Aside from the Federal-state highway work the Bureau of Roads has completed one thousand eight hundred and twenty-three miles of road in the national forests, and there are under construction 1,042 miles, the whole to open up regions of great natural beauty.

More than forty miles of bridges have been built under the Federal Aid Highway program since 1916. One of the largest of these bridges, that from Mandan to Bismarek, N.D., is more than three and one-half miles long and cost \$1,428,000.

The entire Lincoln Highway from the Hudson River to San Francisco Bay is on the Federal System and being completed with Federal Aid—except for a short stretch in western Utah.—Michigan Roads and Pavements.

DID YOU KNOW—

That at the end of every 2,500 miles of service a tire should be deflated, dismounted, soapstone and grit removed and the inside of casing washed with gasoline?

That after drying, the inside should be dusted with tale, the tire mounted and the tube charged with fresh air—and then you're ready again for a spin over the hills and far away.—Illinois Motorist.

IT IS TO LAUGH!

A wealthy motorist, while touring through Georgia, drove up to a gasoline station and found the tender a lazy country boy. "Hey, boy," said the motorist, "I want some gasoline. Get a move on you. You'll never get anywhere in this world unless you push. Push is essential. When I was young I pushed and that got me where I am."

"Well, boss," said the boy, "I reckon as how you'll have to push again, 'cause we ain't got a drop of gas in the place."—Georgia Highways.

FEDERAL AID HIGHWAY SYSTEM AND ITS RELATION TO FLORIDA

(Continued from Page Three)

any one State can not be independently determined. They must be discussed and finally fixed only after consideration with adjacent States so that the matter is tentative until finally we have a series of States in accord with respect to the various routes. Some of the routes I have mentioned are practically fixed at the present time beyond much probability of change; others are not yet determined and may be subject to some adjustment. In any case it will be seen that Florida will have what it has never had before, a series of routes going to its northern boundary which, through Mobile and New Orleans, Montgomery and Birmingham, Atlanta and Chattanooga, Savannah and Columbia, will provide access to the State from every part of the interior.

I have indicated only the principal and direct primary routes; branching from these will be others which will lead into every State from Maine to Washington and from Texas to California. When the Federal Aid System is completed the question will never have to be raised by the tourist "Whether he can pass Darien in Georgia" or "Whether the route is better by Waycross or Valdosta." The Coastal Plain, the Piedmont region and the mountains of northern Georgia will all be traversed by first-class roads that will be continuous regardless of county lines and regardless of State lines. Bridges will be in place, adequate under all foreseeable conditions.

This condition again emphasizes the national aspect of Federal Aid. Florida is as much interested in the roads built outside of her boundaries as she is in those roads built under her jurisdiction and largely with her own funds. Without the systematizing effect of Federal Aid the series of roads leading to this State could not be constructed in all probability in less than a generation or more, and it is quite conceivable from our past experience that one or two dissatisfied counties might maintain by their indifference practically impassable gaps in an otherwise improved through route.

We must not, however, emphasize the primary system unduly as it will constitute less than one-half of the Federal Aid System. There will still be four-sevenths of that system classified as secondary roads which will be continuously improved and just as satisfactory for the traffic which they will be expected to carry. Nor is it proper to give undue emphasis to the demands of through traffic. Florida is perhaps more interested in through traffic than most of the States. Because of summer resorts, Maine, New Hampshire and northern Michigan are likewise interested in through roads, and because of winter resorts in Southern California that State likewise has a peculiar interest, but the large part of the country is in all probability interested principally in local transportation, the business that requires 40 or 50 miles of road radiating from the principal centers. Let me call your attention to the fact that every continuous route, whether primary or secondary, passing through any place provides two local roads for that particular town or city. Where through routes intersect, that place has four

local roads provided. The Federal Aid System should, therefore, be considered rather in the light of a system of connected local roads than as a system of through roads designed for through travel. We have designed the system to take care of local travel first, then we have joined together the local roads as directly as possible continuously from one center of population to another until the result is the biggest highway system in the world and one worthy of our nation and of all the efforts that each of the several States and the Government in cooperation are making to bring it to an early completion.

IMPRESSIONS OF ENGLISH HIGHWAY PRACTICE

(Continued from Page Ten)

land nominally for heating and manufacturing purposes doubtless found its way into the tanks of the motor cars.

To conclude this somewhat sketchy and superficial summary of some rather large subjects, I believe that in speed of road construction, in the matter of road equipment of all kinds, as concerns motor-vehicle regulation, highway financing, and research and experimental work generally, we do not have much to learn from Great Britain.

In matters of road location we can see there in aggravated form the same sort of mistakes which have been made in this country, particularly in the older States, where we have put down expensive pavements on faulty locations with unnecessarily tortuous alignment, a timid following of the line of least resistance, using rights of way good enough, perhaps, when horses did the work but sadly inadequate for our present-day motorized traffic.

It is doubtful if we can hope to equal the bituminous roads of England until we pay more attention to the foundations. We should either follow somewhat after the English methods or develop some substitute, possibly less costly, which will be as effective.

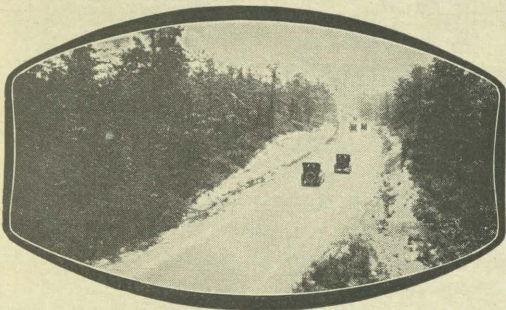
*Ministry of Transport Report on the administration of the road fund for the year 1922-23.

A. A. A. URGES IMMEDIATE ADOPTION UNIFORM MARKING CODE

(Continued from Page Fifteen)

to apply a definite test to danger points and this would prevent the putting of danger signs in places where they are not needed. This is one serious criticism of present day practice. Again, there would be an agreement as to the distance that a sign should be from the point of danger and the distance it should be placed above the level of the road, to mention two other features into which a great deal of variation has crept; another baneful tendency is the crowding of two many words on a sign which often causes delays and annoyances to the motorist.

"Many of the States already have excellent features and it should be possible to work out of these a national code that would become a model. Such a code would go a long way to make the highways more serviceable and a great deal safer for their users than they are today."



White Horse Pike, Da Costa, N. J.

Highway engineers responsible for such concrete highways as that pictured above remember the construction difficulties they had to meet in building the first concrete roads, chiefly the problem of controlling expansion and contraction.

Proper slab design and Carey Elastite Expansion Joint solved this problem and made the concrete highway successful.

Write for engineering data and a sample.

THE PHILIP CAREY CO.

74 Wayne Ave., Lockland,

Cincinnati, Ohio

Carey Elastite

U.S. Patent Office
EXPANSION
JOINT
PROVED AND
ACCEPTED



Elastite Expansion Joint is an elastic resilient material composed of two sheets of asphalt-saturated felt between which is "sandwiched" a body of carefully refined asphaltic compound.

"A Modern Printing Factory"

Process Color Printing Road and Bridge Specifications

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TALLAHASSEE, FLORIDA

THY BROTHER'S KEEPER

(Continued from Page Two)

We boast of the number of cars in the United States, but we sometimes fail to realize the dangers these cars present, not only to motorists but pedestrians. Every city knows this, however, and every city has its acute "traffic problem."

In a recent editorial the Engineering News-Record, a leading scientific magazine, notes that the average city official concerns himself mainly with "opportunistic" measures to promote safety. These have to do with traffic regulatory measures which at best are of merely temporary efficacy. The highway engineer, trained to larger problems, studies methods of permanent relief.

It is there that the real solution lies. Without abandoning the so-called "opportunistic" measures, we must delve deeper and educate both men and communities along scientific lines.

We must understand that the human factor is not constant. We do not know what a driver will do under any given set of circumstances. There is the safe driver and the "fool" driver. It is all very well to say that the fool should suffer from his folly, but today's theory is to save the fool from his folly. It must be remembered that the "fool driver" may not be a fool in other things and that he may be a valuable member of society when he is not at the steering wheel of a car. Also, that his folly does not merely react upon himself, but upon others. His fool driving endangers other lives and bodies.

Therefore it is essential that all motorists be edu-

cated to the use of the most approved safety devices upon their cars. Chains, bumpers, stop-lights, proper wind-shield-cleaning equipment and other safety devices should be thought of immediately in the purchase of a car.

And communities should also afford protection. All traffic problems are not in city streets. Country roads are often more dangerous. Their danger spots should be protected by modern safety devices.

We are our brothers' keepers. We must save them from the danger of their own folly, and, in doing so, save others from the dangers of that folly. —Colorado Highways.

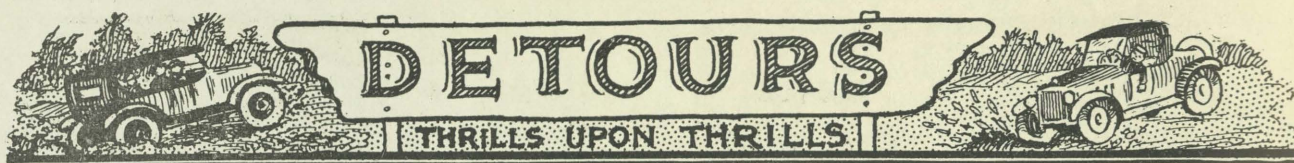
A GASOLINE TAX IS FAIR

(Continued from Page Twelve)

individual owner of the motor vehicle is concerned, the saving involved, twenty or thirty cents to fill his gasoline tank, is too small to invite such evasion. All taxes are evaded to an extent. Gasoline tax evasions in money loss, could not in the remotest way be compared to losses involved in collecting real and personal property and incomes taxes.

Different aspects of the gasoline tax law have been attacked in the courts of several states. The supreme courts of three states and of the United States have upheld gasoline tax laws, when their constitutionality was attacked.

Tourists from other states enjoy good roads and do not help to pay for them. The gasoline tax is the only feasible way to collect the tourists' share.—Alexandria Citizen News.



A Laconian Meets His Match

A certain lawyer who liked to snap out his questions to witnesses in one-syllable words more than met his match when examining a clothing merchant.

Lawyer—"Name?"

Witness—"Moses Solomon."

Lawyer—"Business?"

Witness—"Rotten."

Lawyer—"Born?"

Witness—"Yes."

—Exchange.

It was night in the forest. An eery sound broke the stillness.

"What's that 'orrid noise?" asked the cockney.

"That's an owl," said his country friend.

"I know it's an 'owl," said the cockney, "but what the deuce is 'owling."—Exchange.

Horse On Him

The Boss the other night, in his sleep, was talking about Maude.

"Who is this Maude?" says wifie next morning.

"Oh, that's the name of a horse."

That evening, wifie said: "That horse called you up twice today!"

The Cost of Whistling

Professor Arthur L. Foley, of the University of Indiana, has calculated that 2,434,026 tons of coal, costing \$7,302,078 are consumed annually in the United States in generating steam to blow locomotive whistles.

He maintains that two-thirds of this coal could be saved by higher-pitched whistles placed farther forward on the steam locomotive.—Railways.

Curious Reflex

"The human anatomy is a wonderful bit of mechanism."

"Yes, pat one kind of a man on the back and you'll make his head swell."

He was a colored farm tenant. He was in debt to his landlord and certain time merchants. He was a product of the tenant system. He owned his soul but not his soles. He stood on a corner here and heard the Salvation Army sing hymns. Then a tam-bourine was held out to him. He ignored it. "Juts can't," he said, repeatedly. "You owe it to the Lord," he was told. "Yes, I know it, but He ain't pushing me like the rest," he said.—Raleigh (N. C.) News and Observer.

Common sense is undefinable. The only thing that may be said of it with certainty is that it is not common.—Little Rock, Arkansas, Gazette.

"There was a faith-healer of Deal
Who said, 'Although pain isn't real,
If I sit on a pin,
And it punctures my skin,
I dislike what I fancy I feel'."

One thing the world needs is an amplifier for the still small voice.—West Palm Beach Post.

Unbearable

The applicant for cook was untidy and insolent in appearance.

"Don't hire her," whispered Jones to his wife. "I don't like her looks."

"But," remonstrated his wife, "just consider the reputation for cooking she bears."

"That doesn't matter," said Jones testily. "We don't want any she bears cooked. We don't like them."

A Last Resort

A headline says: "Speeding Tourist Crashes Through Billboard." His only chance to get a glimpse of the scenery.—Altoona Tribune.

Saves Time, Anyway

Brown—"Since I bought a car I don't have to walk to the bank to make any deposits."

Black—"Ah, you ride there?"

Brown—"No, I don't make any."

The Efficacy of Prayer

A western farmer was astonished to receive the following letter from his son in college:

"Dear Father—I am in a deuce of a hole. Kindly send me \$100, and oblige. Your loving son, Pat."

P. S.—After writing this letter I was so stricken with remorse that I ran after the postman and tried to get it back. I can only pray that it will not reach you."

But who could be more astonished than the son to receive this reply:

"Dear Son—Your prayers are answered. The letter did not reach me.—Dad."

Latest Make

"Do you know, I believe your husband is going to get locomotor ataxia."

"I shouldn't wonder—he has a perfect mania for buying cars."—The Sydney Bulletin.

Last and Hardest

Teacher—"What were the different ages in history?"

Willie—"The stone age, bronze age, iron age."

Teacher—"What age are we living in now?"

Willie—"The hard-boiled age."—Vancouver Province.

The Union Forever

Yankee Abroad—"I just bought a Rembrandt."

Patriotic American—"Well, American cars are good enough for me!"—Judge.

Some people remind us of auto tail lights because they only know where they have been.

Trouble Both Ways

An Austrian barrister tells of a black fellow charged in a country town with stealing. His solicitor decided to put him in the box to give evidence on his own behalf. The magistrate, being doubtful if he understood the nature of an oath, undertook to examine him on the point.

"Jacky," he said, "you know what will happen to you if you tell a lie?"

"My oath, boss," replied Jacky, "me go down below—burn long time."

"Quite right," replied the magistrate. "And now you know what will happen if you tell the truth?"

"Yes, boss. We lose 'em case."—*Sidney Herald.*

Japanese Schoolboy Howlers

Q. What do you light a cigaret with?

A. (1) Yes, I like it very much. (2) With hand.

Q. What is the last letter of the English alphabet?

A. Yours truly.

Q. Why do we use mosquito nets?

A. (1) To catch a bird. (2) It is used to protect the mosquito.

Q. What is an alarm clock?

A. (1) Arm clock is tied by the arm. (2) If you put it at 6:50 to berst, it will be berst.

Q. What meter is Tennyson's "Ulysses" written in?

A. (1) In diameter. (2) Thermometer. (3) It is written in meterphor.—*T. P.'s Weekly (London.)*

MAKES EASIER STEERING

Steering is made easier—and in many instances safer—by grasping the wheel at the sides near the top. With the hands in this position a quicker, sharper and easier turn can be made in either direction. A full right or left turn can be made with one downward pull on the wheel by the hand on the respective side. For ordinary driving it may be more comfortable to keep the hands on the bottom of the steering wheel rim, but when tackling traffic or a winding road the top of the wheel is best for top-notch steering.—*Illinois Motorist.*

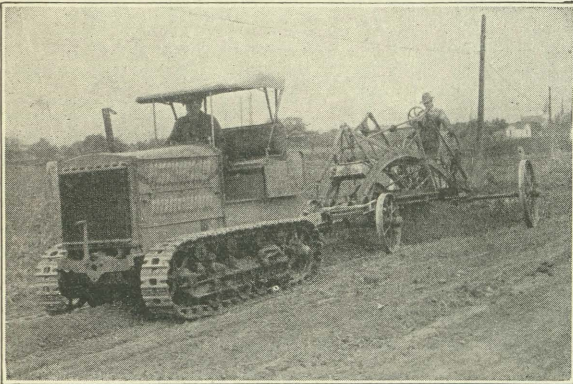
OUR SERVICE ON

Contract Bonds

and all other classes of Surety Bonds is unsurpassed.

American Surety Company of New York

Atlanta, Ga., Branch Office, 1320 Hurt Building.
H. N. HUTCHINSON, Manager.



Consider the Grader

The ultimate success or failure of practically every road, regardless of the type of surface, rests with the construction of the subgrade. Improvements in machines, methods and materials may come and go, but the fact remains that the highest type of pavement will fail if the subgrade is faulty, either in design or construction.

Included in the long list of Austin-Western Graders and Grader-Scarifiers there is bound to be a model as good as made to order for your own particular requirements; no matter whether you need a machine that will build a new grade through the roughest kind of country; one that will tear up an old, hard-as-sin roadbed preparatory to laying a new surface; or one for some of the many other kinds of work on which a grader is needed.

The Austin-Western Road Machinery Co.

General Offices:

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Ocala Lime Rock—Florida's Natural Road Material

E. W. ELLIS, President. C. G. ROSE, Sec'y-Treas.

Ocala Lime Rock Co.

INCORPORATED

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LIME ROCK QUARRIES

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Daily Capacity Plants, 3,000 Tons.

Office: Jones Building,
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Telegraph: Ocala. Phone 264.

Status of Road Construction

THROUGH JANUARY 31ST, 1925

			Total		Clearing Miles	Grading Miles	Base Miles	Surface Miles	Per Cent	
Project No.	Contractor.	Road No.	County	Length Miles					Type	Complete
26	C. F. Lytle.....	2	Columbia	11.01				0.00	C.	0.00
37-D	Fla. Drainage & Const. Co..	2	Alachua	2.14	0.00	.63			G.	31.00
40-A	C. F. Lytle.....	4	Brevard	16.17	15.36	11.16	7.60	0.00	S.T.	54.00
40-D	J. Y. Wilson.....	4	Brevard	6.72	6.72	6.72	6.05	0.00	S.T.	87.00
40-E	Langston Const. Co.....	4	Brevard	13.60	13.60	13.60	10.88	0.00	S.T.	85.00
43	Wm. P. McDonald Const Co.	2	Marion	10.44	9.92	7.62	0.00	0.00	S.A.	13.96
44	Southern Paving Const. Co.	2	Lake	10.53	10.53	9.48	8.95	4.21	B.C.	64.14
514	State Forces	1	Jackson	11.00	0.00	0.00		0.00	S.C.	1.80
521	Morgan-Hill Paving Co....	4	Nassau	12.41	12.41	12.41	12.41	12.41	S.T.	100.00
534-A	J. D. Donahoo & Sons.....	24	Brevard	2.65	2.65	2.17	0.00	0.00	S.T.	82.00
534-B	Noll & Noll.....	24	Brevard	11.85	11.85	11.85	7.58	0.00	S.T.	62.00
564-A	Edgar Chapman, Broadbent Const. Co.	5	Charlotte	10.88	10.33	6.52	.22	0.00	S.T.	54.00
564-B	Boone & Wester.....	5	Charlotte	9.86	9.86	9.86		6.01	Marl	90.00
567	State Forces	1	Walton	21.35	14.94	6.40		2.37	S.C.	31.60
571	Hunter & Gladwell.....	1	Madison	14.73	14.73	14.58		7.36	S.C.	89.00
574	Duval Engr. & Const. Co...	9	Madison	11.66	11.66	11.66	0.00	0.00	S.T.	25.00
576	S. T. Buchanan & Sons, Broadbent Const. Co....	5	Sarasota	5.68	5.68	5.22	0.00	0.00	S.T.	25.00
586	State Forces	1	Jackson and Washington ..	17.37	10.77	8.34		5.21	S.C.	62.60
588	Morgan-Hill Paving Co....	8	Putnam	2.34	0.00	0.00	0.00	0.00	S.A.	0.00
595	State Forces	3	Volusia	6.42	0.00	0.00	0.00	0.00	S.T.	0.00
597	J. Y. Wilson.....	4	Volusia	16.29	16.29	12.22	0.00	0.00	S.T.	25.00
598-A	W. J. Bryson Paving Co....	1	Jefferson	9.45	9.45	9.45		4.44	S.C.	97.00
598-B	State Forces	1	Jefferson	7.80	7.80	7.02		6.63	S.C.	82.00
599	M. M. Boyd.....	2	DeSoto-Charlotte.	7.40	7.40	7.35		7.18	Marl	99.00
604	C. F. Lytle.....	4	Volusia	7.72	6.41	3.12	1.70	0.00	S.T.	26.00
607-B	State Forces	13	Clay	5.68	5.68	4.82	0.00	0.00	S.T.	20.00
608	C. F. Lytle.....	4	Brevard	9.25	8.32	6.47		0.00	C.	15.00
612	State Forces	1	Leon	17.58	15.82	9.67		2.64	S.C.	51.70
613	State Forces	5	Sarasota	4.62	3.93	.55	0.00	0.00	S.T.	2.00
621	State Forces	1	Okaloosa	15.17	0.00	0.00		0.00	S.C.	0.00
623	State Forces	35	Madison	12.32	3.94	2.71		0.00	S.C.	14.40
627	State Forces	2	Putnam	3.70	2.96	.52	0.00	0.00	S.T.	6.30
628-D	State Forces	3	Volusia	6.47	6.14	4.01	0.00	0.00	S.T.	17.10
630	Myers Construction Co....	8	Highlands	11.00			1.32	0.00	S.T.	12.00
633	State Forces	1	Gadsden	9.61	0.00	0.00		0.00	S.C.	0.00
634	State Forces	1	Jackson	11.07	5.52	2.77		1.10	S.C.	34.10
636	C. F. Lytle	8	St. Lucie	12.20	0.00	0.00	0.00	0.00	S.T.	0.00
637	State Forces	10	Leon	18.00	0.00	0.00		0.00	S.C.	0.00
639	State Forces	1	Gadsden	9.84	0.00	0.00		0.00	S.C.	0.00
646	Newell Contr. Co.....	10	Franklin	18.50						

TOTAL MILES COMPLETE

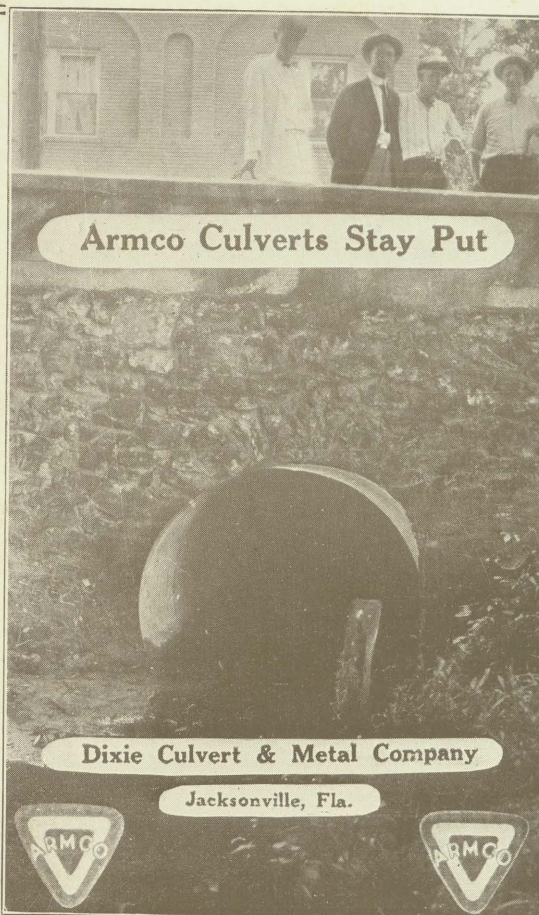
	Concrete	Brick	B.C.	S.A.	B.M.	Asp.	Blk	S.T.	S.C.	Marl	Grad.	Total
Complete December 31, 1924....	107.61	12.44	5.62	42.23	71.50	23.20	249.12	303.26	36.72	20.06		871.76
January, 1925 .....	.02	.00	1.34	.16	0.00	0.00	7.96	5.31	.29	.04		15.12
Total to date	107.63	12.44	6.96	42.39	71.50	23.20	257.08	308.57	37.01	20.10		886.88

	Clearing Miles.	Graded Miles.	Base Miles	Surface Miles.
Complete December 31, 1924	1,002.40	950.23	326.85	861.71
January, 1925	10.62	12.23	10.38	26.82
Total to date	1,013.02	962.46	337.23	888.53

Note—The above tabulation shows only those projects that are actually under construction at the present time and does not show projects that have been previously completed. However, the table, "Total miles completed," at the foot includes all projects that have been completed prior to January 31, 1925, and the amount completed in January also. The abbreviations used are as follows:

C.—Concrete. S.A.—Sheet asphalt. B.M.—Bituminous macadam. R.—Rock base. S.C.—Sand clay. G. & D.—Graded and drained. S.T.—Surface treated. B.C.—Bituminous concrete.

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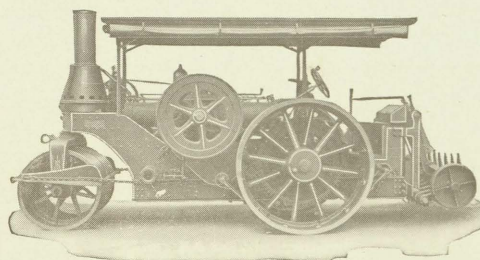
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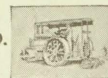
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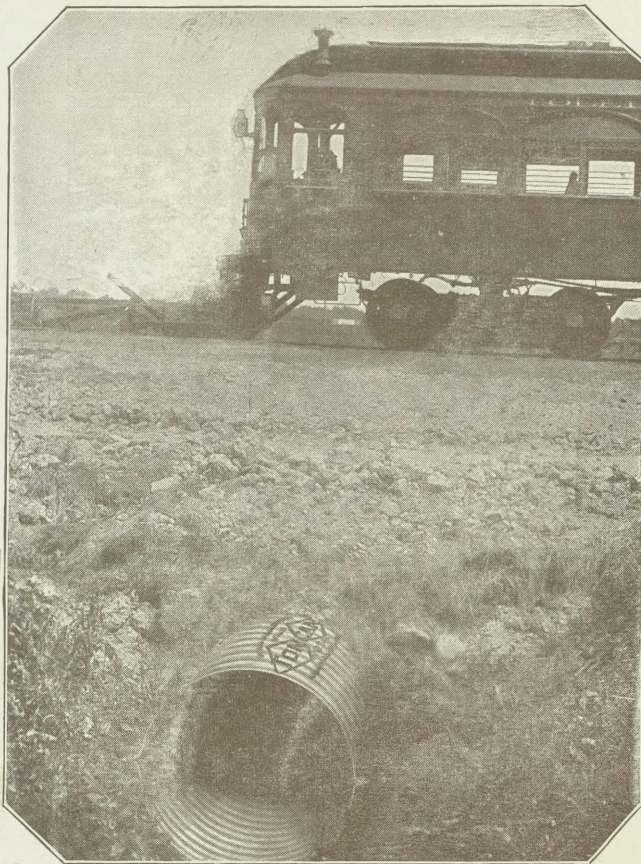
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